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EXAMINER

DOAN, THERESA T

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 09/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/989,372

Applicant(s)

LANE, RICHARD H.

Examiner

Theresa T Doan

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 29-32, 34-39, 41, 44-47, 49 and 51-64 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 29-32, 34-39, 41, 44-47, 49 and 51-64 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. The amendment to the claims filed on 06/05/03 does not comply with the requirements of 37 CFR 1.121(c) because in claim 36 (in the amendment claimed on 02/10/03), the limitation of "a conductive layer provided over a semiconductor substrate" in line 2; and the limitation of "said conductive layer" in line 4 should be shown by brackets for deleted matter. And also in claim 36 (in marked up version), the limitation of "a substrate" in line 2 should be shown underlining for added matter. Amendments to the claims filed after March 1, 2001 must comply with 37 CFR 1.121(c) which states:

(c) Claims.

(1) Amendment by rewriting, directions to cancel or add: Amendments to a claim must be made by rewriting such claim with all changes (e.g., additions, deletions, modifications) included. The rewriting of a claim (with the same number) will be construed as directing the cancellation of the previous version of that claim. A claim may also be canceled by an instruction.

(i) A rewritten or newly added claim must be in clean form, that is, without markings to indicate the changes that have been made. A parenthetical expression should follow the claim number indicating the status of the claim as amended or newly added (e.g., "amended," "twice amended," or "new").

(ii) If a claim is amended by rewriting such claim with the same number, the amendment must be accompanied by another version of the rewritten claim, on one or more pages separate from the amendment, marked up to show all the changes relative to the previous version of that claim. A parenthetical expression should follow the claim number indicating the status of the claim, e.g., "amended," "twice amended," etc. The parenthetical expression "amended," "twice amended," etc. should be the same for both the clean version of the claim under paragraph (c)(1)(i) of this section and the marked up version under this paragraph. The changes may be shown by brackets (for deleted matter) or underlining (for added matter), or by any equivalent marking system. A marked up version does not have to be supplied for an added claim or a canceled claim as it is sufficient to state that a particular claim has been added, or canceled.

(2) A claim canceled by amendment (deleted in its entirety) may be reinstated only by a subsequent amendment presenting the claim as a new claim with a new claim number.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2814

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claim 29-32,34-39,41,44-47,49 and 51-64 are rejected under 35 U.S.C. 102(e) as being anticipated by Agarwal et al. (U.S. 6,297,527).

The applied reference has a common Assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Regarding claims 29-32 and 34-35, Agarwal et al. teach in figures 1-21 a semiconductor device comprising:

- a semiconductor substrate 50;

- an insulating layer 60 provided over the substrate; and

Art Unit: 2814

a platinum metal layer 74 provided over the insulating layer to form a lower capacitor electrode 74, wherein the metal layer having a thickness of approximately 50-300 angstroms and wherein a top surface of the metal layer 74 is down to the insulating layer (figure 3, column 5, lines 41-43).

Regarding claims 36-39 and 41, Agarwal et al. teach in figures 1-21 a memory cell comprising:

a platinum metal layer 74 provided over a substrate, the platinum metal layer 74 having a thickness of approximately 50-300 angstroms (figure 3, column 5, lines 41-43);

a transistor 58 including a gate fabricated on the semiconductor substrate and including a source/drain region (54, 56) in the semiconductor substrate disposed adjacent to the gate (figure 3, column 5, lines 3-14); and

a container capacitor including a lower electrode 74, the lower electrode having a surface aligned over the source/drain region, the platinum metal layer forming the lower electrode.

Regarding claims 44-47 and 49, Agarwal et al. further teach in figures 1-22 a processor-based system comprising:

a processor (figure 22, column 8, lines 6-23); and

an integrated circuit coupled to the processor, at least one of the integrated circuit and processor comprising a container capacitor including a platinum lower electrode.

Art Unit: 2814

Regarding claims 55-58, Agarwal et al. further teach in figures 1-21 a container capacitor comprising:

a platinum lower electrode 74 comprising a metal layer having a bottom wall and vertical sidewalls extending upwardly, wherein the metal layer 74 has a thickness of approximately 50-300 angstroms (figure 3, column 5, lines 41-43);

an insulating layer provided over the metal layer; and

an upper electrode provided over the insulating layer.

Regarding claim 59, Agarwal et al. further teach in figure 3 a container capacitor comprising: a barrier conductive layer 80.

Regarding claims 60-64, Agarwal et al. further teach in figures 1-21 a container capacitor comprising: a plurality of opening provided in the insulating layer; and a plurality of platinum lower capacitor electrodes provided along the bottom and sidewalls of respective ones of the openings, the platinum lower electrodes being formed as discrete metal layers, wherein the platinum electrodes 74 have a thickness of approximately 50-300 angstroms (figure 3, column 5, lines 41-43).

Regarding claims 51-54, Agarwal et al. further teach in figures 1-22 the integrated circuit is a memory module that includes a DRAM, a SRAM memory or a MCM memory.

Art Unit: 2814

Regarding the process limitation recited in claims 29-32,34-39,41,44-47,49 and 51-64 (an electro-polished patterned, forming), these would not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced.

Note that a "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and *In re Marosi et al.*, 218 USPQ 289; and particularly *In re Thorpe*, 227 USPQ 964 (Fed. Cir. 1985), all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that the applicant has the burden of proof in such cases, as the above case law makes clear. See also MPEP 706.03(e).

4. Claims 29-32,34-39,41,44-47,49 and 51-64 are rejected under 35 U.S.C. 102(e) as being anticipated by Xing et al. (U.S. 6,090,697).

Regarding claims 29-32 and 34-35, Xing et al. teach in figure 3 a semiconductor device comprising:

a semiconductor substrate 300;

an insulating layer 302 provided over the substrate; and

Art Unit: 2814

a platinum metal layer 304 provided over the insulating layer to form a lower capacitor electrode, wherein the metal layer having a thickness of approximately 100-500 angstroms and wherein a top surface of the metal layer 304 is down to the insulating layer (figure 3, column 6, lines 13-17).

Regarding claims 36-39 and 41, Xing et al. teach in figures 3 and 6a, a memory cell comprising:

a platinum metal layer 304 provided over a substrate, the platinum metal layer 304 having a thickness of approximately 100-500 angstroms (figure 3, column 6, lines 13-17);

a transistor including a gate fabricated on the semiconductor substrate and including a source/drain region in the semiconductor substrate disposed adjacent to the gate (figure 6a); and

a container capacitor including a lower electrode 304, the lower electrode having a surface aligned over the source/drain region, the platinum metal layer forming the platinum lower electrode.

Regarding claims 44-47 and 49, Xing et al. teach in figure 3 a processor-based system comprising:

a processor (column 13, lines 14-22); and

Art Unit: 2814

an integrated circuit coupled to the processor, at least one of the integrated circuit and processor comprising a container capacitor including a platinum lower electrode.

Regarding claims 55-58, Xing et al. teach in figure 3 a container capacitor comprising:

a platinum lower electrode 304 comprising a metal layer having a bottom wall and vertical sidewalls extending upwardly, wherein the platinum metal layer has a thickness of approximately 100-500 angstroms (figure 3, column 6, lines 13-17);

an insulating layer 312 provided over the metal layer; and

an upper electrode 314 provided over the insulating layer.

Regarding claim 59, Xing et al. teach in figure 3 a container capacitor comprising: a barrier conductive layer 308.

Regarding claims 60-64, Xing et al. teach in figure 3 a container capacitor comprising: a plurality of opening provided in the insulating layer; and a plurality of platinum lower capacitor electrodes provided along the bottom and sidewalls of respective ones of the openings, the platinum lower electrodes being formed as discrete metal layers, wherein the platinum electrodes 304 have a thickness of approximately 100-500 angstroms (figure 3, column 6, lines 13-17).

Art Unit: 2814

Regarding the process limitation recited in claims 29-32,34-39,41,44-47,49 and 51-64 (an electro-polished patterned, forming), these would not carry patentable weight in this claim drawn to a structure, because distinct structure is not necessarily produced. Note that a "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Brown*, 173 USPQ 685; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and *In re Marosi et al.*, 218 USPQ 289; and particularly *In re Thorpe*, 227 USPQ 964 (Fed. Cir. 1985), all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that the applicant has the burden of proof in such cases, as the above case law makes clear. See also MPEP 706.03(e).

Response to Arguments

Applicant argues that "the limitation "electropolished patterned" is simply not a product-by-process limitation, but rather a resulting structure having distinct and defined characteristics". It should be noted that claims 29, 36, 44, 55 and 59-60 are not directed to any method for making a semiconductor device, but rather, are directed to the resulting of a semiconductor device. Therefore, the process limitation recited in claims 29, 36, 44, 55 and 59-60 (an electro-polished patterned) would not carry patentable

Art Unit: 2814

weight in claims drawn to a structure because these claims are directed to the product, no matter how the product of these claims is actually made, and the patentability of the final product must be determined, not the patentability of the process, which in any case have not been presented in "product by process" claims. In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985). Applicant's argument thus is not persuasive because the final structure of the metal formed by electropolished process as claimed does not distinguish from the final structure of the metal layer of Dornfes, Aoki and Okutoh.

Applicant's arguments with respect to claims 29-32, 34-39, 41, 44-47, 49 and 51-64 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments, addressed to the amended claims are considered in the rejections shown above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Theresa T Doan whose telephone number is (703) 305-2366. The examiner can normally be reached on Monday to Thursday from 8:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, WAEL FAHMY can be reached on (703) 308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

TD
August 12, 2003


PHAT X. CAO
PRIMARY EXAMINER